

WHAT IS CLAIMED IS:

1. A resonator assembly comprising:
a first wafer;
at least one pit etched in said first wafer;
a second wafer coupled to said first wafer; and
at least one pit etched in said second wafer,
wherein said at least one pit etched in said first wafer and said at least one pit etched in said second wafer are arranged so as to form at least one cavity.
2. The resonator assembly according to claim 1, further comprising:
a transmission line which carries an input signal; and
an input structure which enables the input signal to be introduced into said at least one cavity from said transmission line.
3. The resonator assembly according to claim 2, wherein said input structure comprises an aperture formed in at least one of said first wafer and said second wafer.
4. The resonator assembly according to claim 3, wherein the input signal travels from the transmission line through the aperture and into said at least one cavity.
5. The resonator assembly according to claim 2, wherein the input structure comprises an aperture formed in a layer of metal disposed on at least one of said first wafer and said second wafer.

6. The resonator assembly according to claim 1, further comprising a third wafer coupled to said second wafer.

7. The resonator assembly according to claim 6, further comprising a layer of metal disposed on at least one of said first wafer, said second wafer, and said third wafer.

8. The resonator assembly according to claim 7, further comprising:
a transmission line which carries an input signal; and
an input structure which enables the input signal to be introduced into said at least one cavity from said transmission line.

9. The resonator assembly according to claim 8, wherein said transmission line comprises at least one of a microstrip line and a waveguide.

10. The resonator assembly according to claim 8, wherein said input structure comprises an aperture formed in at least one of said first wafer, said second wafer, and said third wafer.

11. The resonator assembly according to claim 10, wherein the input signal travels from the transmission line through the aperture and into said at least one cavity.

12. The resonator assembly according to claim 8, wherein said input structure comprises an aperture formed in said layer of metal disposed on at least one of the first wafer, second wafer, and third wafer.

13. The resonator assembly according to claim 12, wherein the input signal travels from said transmission line into at least one of said first wafer, said second wafer, and said third wafer, and is introduced into said at least one cavity through the aperture formed in said layer of metal.

14. The resonator assembly according to claim 13, further comprising a plurality of via holes surrounding the aperture formed in the layer of metal.

15. The resonator assembly according to claim 13, wherein said at least one cavity is hermetically sealed.

16. The resonator assembly according to claim 1,
wherein said at least one pit etched in said first wafer comprises a first plurality of pits,
wherein said at least one pit etched in said second wafer comprises a second plurality of pits, and
wherein the first plurality of pits and second plurality of pits are arranged so as to form a plurality of cavities.

17. The resonator assembly according to claim 16, wherein the plurality of cavities comprises:

a first resonator cavity;

a second resonator cavity;

and a coupling cavity disposed between said first resonator cavity and said second resonator cavity.

18. The resonator assembly according to claim 17, wherein the plurality of cavities are disposed so as to form a filter.

19. The resonator assembly according to claim 16, wherein at least one of the second plurality of pits is etched completely through the second wafer.

20. The resonator assembly according to claim 16, further comprising a third wafer coupled to said second wafer.

21. The resonator assembly according to claim 20, further comprising a layer of metal disposed on at least one of said first wafer, said second wafer, and said third wafer.

22. The resonator assembly according to claim 7, further comprising a tuning structure that is able to adjust a frequency characteristic of the resonator assembly.

23. The resonator assembly according to claim 22, further comprising an aperture formed in at least one of said first wafer, said second wafer, and said third wafer,

wherein said tuning structure comprises a piece of dielectric that is provided in said at least one cavity through said aperture.

24. The resonator assembly according to claim 22, further comprising:
an aperture formed in at least one of said first wafer, said second wafer, and said third wafer,
wherein said tuning structure comprises a metal cap that is provided in said aperture.
25. The resonator assembly according to claim 22, further comprising:
an aperture formed in said layer of metal,
wherein said tuning structure comprises a capacitive element that is provided on at least one of said first wafer, said second wafer, and said third wafer.
26. The resonator assembly according to claim 25, further comprising a plurality of via holes that extend through at least one of said first wafer, said second wafer, and said third wafer,
wherein the via holes are formed so as to surround said aperture formed in said layer of metal.
27. The resonator assembly according to claim 25, wherein the capacitive element comprises a varactor diode.
28. The resonator assembly according to claim 1, wherein said first wafer and said second wafer are formed of silicon.
29. The resonator assembly according to claim 2, wherein said first wafer and said second wafer are formed of glass.

30. A resonator assembly comprising:

- a first wafer;
- at least one pit etched in said first wafer;
- a second wafer coupled to said first wafer;
- a plurality of pits etched in said second wafer;
- a third wafer coupled to said second wafer; and
- at least one pit etched in said third wafer,

wherein said plurality of pits etched in said second wafer are etched such that said second wafer forms a beam extending from at least a first end of the resonator assembly.

31. The resonator assembly according to claim 30, wherein said plurality of pits etched in said second wafer are etched such that the beam extends from the first end of the resonator assembly to a second end of the resonator assembly.

32. The resonator assembly according to claim 31, wherein the beam is formed so as to be substantially H-shaped.

33. The resonator assembly according to claim 30, wherein a plurality of the beams are arranged so as to form a filter.

34. The resonator assembly according to claim 30, wherein the at least one pit etched in said first wafer and the at least one pit etched in said third wafer are arranged so as to form a cavity such that the beam formed by said second wafer is disposed within the cavity.

35. The resonator assembly according to claim 30, further comprising a fourth wafer coupled to said third wafer.

36. The resonator assembly according to claim 35, further comprising a layer of metal provided on at least one of said first wafer, said second wafer, said third wafer, and said fourth wafer.

37. A method for convex corner protection comprising:
providing a wafer having a first etch masking layer on a first side of said wafer and a second side of said wafer, wherein the second side is disposed opposite to the first side;
patterning a first pit and a second pit on the first side of the wafer;
etching the wafer so as to form the first pit and the second pit in said wafer;
providing a second etch masking layer on the first side of the wafer such that an inside of the first and second etched pits are covered by the second etch masking layer;
patterning the wafer on the second side of said wafer such that the second masking layer is disposed only in an area between the first and second etched pits; and
etching the second side of said wafer so as to remove the portion of the wafer not covered by the second masking layer.

38. The method for convex corner protection according to claim 37, wherein etching the first pit and the second pit in said wafer comprises etching the first and second pits so as to leave a first opening and second opening in the second side of said wafer.